

Application Serial No. 10/811,572
Response Dated October 18, 2005
Reply to Restriction dated July 20, 2005

Amendments to the claims

This listing of claims will replace all prior versions and listings of claims in the application.

Listing of Claims

1. (Currently Amended) A method of attaching two wafers, the method comprising:
providing a first wafer having a first side and a second side;
providing a second wafer having a first side and a second side;
creating at least one pit into the first side of the second wafer to define at least two [[a]] pillars, wherein the pit has a perimeter with perimeter walls, and the at least two pillars extend up from a bottom of the pit and are spaced inward from the perimeter walls of the pit;
adapting at least one of the pillars to conduct an electrical signal;
providing a contact pad on a first side of the first wafer;
aligning the first wafer and the second wafer such that the at least one pillar that is adapted to conduct an electrical signal corresponds to the contact pad;
attaching the first wafer to the second wafer.
2. (Currently Amended) The method of claim 1 further including providing an electronic component on the second wafer, wherein the electronic component is electrically connected to the contact pad on the first wafer via at least one of the pillars.
3. (Original) The method of claim 2 wherein the electronic component includes an

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inductor.

4. (Original) The method of claim 3 wherein the inductor is provided on the first side of the second wafer.

5. (Withdrawn) The method of claim 3 wherein the inductor is provided on the second side of the second wafer.

6. (Withdrawn) The method of claim 3 wherein the inductor is integral to the second wafer.

7. (Withdrawn) The method of claim 2 wherein the electronic component includes a capacitor.

8. (Withdrawn) The method of claim 2 wherein the electronic component includes a transformer.

9. (Original) The method of claim 2 wherein the electronic component includes a transistor.

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10. (Withdrawn) The method of claim 2 wherein the electronic component includes an optical device.

11. (Withdrawn) The method of claim 10 wherein the optical device is adapted to receive an optical signal.

12. (Withdrawn) The method of claim 10 wherein the optical device is adapted to produce an optical signal.

13. (Withdrawn) The method of claim 2 wherein the electronic component is an antenna.

14. (Original) The method of claim 1 wherein the step of attaching the first wafer to the second wafer includes causing an area of solder provided on at least one of the first wafer and the second wafer to reflow.

15. (Original) The method of claim 1 wherein the step of adapting the pillar to conduct an electric signal includes doping an area of the pillar.

16. (Original) The method of claim 1 wherein the step of adapting the pillar to

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conduct an electric signal includes depositing a conductive material on the pillar.

17. (Original) The method of claim 1 further including the step of providing a slanted side on the pillar, the slanted side being adapted for receiving a deposited conductive material.

18. (Original) The method of claim 1 wherein the step of attaching the first wafer to the second wafer includes creating a sealed chamber between the first wafer and the second wafer.

19. (Original) The method of claim 1 wherein the step of attaching the first wafer to the second wafer includes adhering the first wafer to the second wafer using a method chosen from the group consisting of soldering, glass frit, anodic bonding, fusion bonding, photoresist adhesion, polymethyl methacrylate bonding, wax bonding, low temperature glass melt, and bonding using an applied adhesive.

20-29. (Canceled)

30. (Currently Amended) A method comprising:
providing a first wafer having a first side and a second side;
providing a second wafer having a first side and a second side;

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creating at least one pit into the first side of the second wafer to define at least a first pillar and a second pillar, wherein the pit has a perimeter with perimeter walls, and the pillars extend up from a bottom of the pit and are spaced inward from the perimeter wall of the pit;
adapting the first pillar to conduct an electrical signal;
adapting the second pillar to conduct an electrical signal;
providing an electronic device having a first lead and a second lead, the first lead coupled to the first pillar and the second lead coupled to the second pillar;
providing a first contact pad and a second contact pad on a first side of the first wafer;
aligning the first wafer and the second wafer such that the first pillar corresponds to the first contact pad and the second pillar corresponds to the second contact pad;
attaching the first wafer to the second wafer.

31. (Canceled)

32. (Currently Amended) A method comprising:
providing a first wafer having a first side and a second side;
providing a second wafer having a first side and a second side;
creating at least one pit having a perimeter with perimeter walls into the first side of the second wafer to define a pillar, wherein the pillar extends up from a bottom of the pit and is spaced inward from the perimeter walls of the pit;

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adapting a first region of the pillar to conduct an electrical signal;
adapting a second region of the pillar to conduct an electrical signal, the second region
being substantially electrically isolated from not overlapping the first region;
providing an electronic device having a first lead and a second lead, the first lead
electrically coupled to the first region of the pillar and the second lead electrically coupled to the
second region of the pillar;
providing a first contact pad and a second contact pad on a first side of the first wafer;
and
attaching the first wafer to the second wafer such that the first region of the pillar is
electrically connected to the first contact pad and the second region of the pillar is electrically
connected to the second contact pad.

33. (Currently Amended) A method comprising:
providing a first wafer with [[the]] a circuit, the circuit including a first contact pad and a
second contact pad;
providing a second wafer having a first side and a second side;
removing portions of the first side of the second wafer to define a pit having a perimeter
with perimeter walls, and a pillar extending up from a bottom of the pit, wherein the pillar is
spaced inward from the perimeter walls of the pit;
adapting a first region of the pillar to be electrically conductive;

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adapting a second region of the pillar to be electrically conductive, the second region electrically separate from the first region;
applying a metallization layer to at least the first side of the pillar, the metallization layer defining an inductive element having a first lead and a second lead;
providing an electrical connection between the first lead and the first region;
providing an electrical connection between the second lead and the second region;
attaching the first side of the second wafer to the first wafer such than an electrical connection between the first region and the first contact pad is created and an electrical connection between the second region and the second contact pad is created.

34. (Original) The method of claim 33 wherein the step of providing an electrical connection between the second lead and the second region includes the steps of:
providing a conductive element along the second side of the second wafer;
placing a first via from the first side of the second wafer to the second side of the second wafer, the first via providing an electrical connection between the second lead and the conductive element;
placing a second via from the first side of the second wafer to the second side of the second wafer, the second via providing an electrical connection between the second region and the conductive element.

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35. (Original) The method of claim 33 wherein the step of providing an electrical connection between the second lead and the second region includes the steps of:

applying a dielectric layer over a portion of the metallization layer corresponding to a region of the inductive element; and

providing a conductive element from the second lead to the second region over the dielectric layer.

36-44. (Canceled)

45. (New) A method of attaching two wafers, the method comprising:

providing a first wafer having a first side and a second side;

providing a second wafer having a first side and a second side;

creating at least one pit into the first side of the second wafer to define a pillar;

adapting the pillar to conduct an electric signal, wherein the step of adapting the pillar to conduct an electric signal includes doping an area of the pillar;

providing a contact pad on a first side of the first wafer;

aligning the first wafer and the second wafer such that the pillar corresponds to the contact pad;

attaching the first wafer to the second wafer.